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1996

EPA Superfund
Record of Decision:

TOBYHANNA ARMY DEPOT
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TOBYHANNA, PA
07/12/1996

RECORD OF DECISION

OPERABLE UNIT #3

TOBYHANNA ARMY DEPOT
TOBYHANNA, PENNSYLVANIA

JULY 1996

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ABBREVIATIONS AND ACRONYMS

AEHA	US Army Environmental Hygiene Agency
AOC	Area of Concern
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
COCs	Contaminants of Concern
CSF	Carcinogenic Slope Factor
DA	Department of the Army
DRMO	Defense Reutilization and Marketing Office
EPA	United States Environmental Protection Agency
FFA	Federal Facilities Agreement
FS	Feasibility Study
HI	Hazard Index
HQ	Hazard Quotient
IRP	Installation Restoration Program
mg/kg/day	Milligrams per kilogram per day
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
OU	Operable Unit
PADEP	Pennsylvania Department of Environmental Protection
PCB	Polychlorinated Biphenyls
PRAP	Proposed Remedial Action Plan
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SWMU	Solid Waste Management Unit
TYAD	Tobyhanna Army Depot
USACHPPM	United States Army Center for Health Promotion and Preventive Medicine
VOC	Volatile Organic Compound

DECLARATION FOR THE RECORD OF DECISION
REMEDIAL ALTERNATIVE SELECTION

Site Name and Location

Operable Unit No. 3
Area of Concern (AOC) 37, Building 10-C
and AOC 38, Building S-90
Tobyhanna Army Depot
Tobyhanna, Monroe County, Pennsylvania

Statement of Basis and Purpose

This decision document presents a determination that no further action is necessary to protect human health and the environment for Operable Unit No. 3 (OU3), Building 10-C and Building S-90 at the Tobyhanna Army Depot, Tobyhanna, Monroe County, Pennsylvania (TYAD). This determination was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This document was prepared as a joint effort between the U.S. Army, Pennsylvania Department of Environmental Protection (PADEP) and the Environmental Protection Agency (EPA). The no further action decision is supported by documents contained in the Administrative Record.

Description of the Selected Remedy

A no further action alternative is the selected remedy for OU3. As a condition of a Resource Conservation and Recovery Act (RCRA) Part B Permit issued by PADEP in January 1993, the following closure activities were performed in April-May 1993: (1) removal of hazardous wastes from buildings; (2) inspection of building interiors; (3) vacuuming of walls and floors; (4) decontamination of buildings; (5) sampling of building interiors and exteriors; (6) performance of a risk assessment and (7) certification of closure in accordance with the RCRA Part B Permit. All results from closure activities have been documented in the U.S. Army Environmental Hygiene Agency (AEHA) Hazardous Waste Management Study (AEHA, 1993). A Risk Assessment, conducted as part of closure activities at OU3, supports the no further action remedial alternative.

Declaration

The no further action remedy selection is based upon the post-closure confirmation sampling results which were found to be within the EPA's acceptable risk range. Therefore the selected remedy is protective of human health and the environment. A five-year review will not be necessary for OU3.

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DECISION SUMMARY

1.0 INTRODUCTION

On July 14, 1989, the Tobyhanna Army Depot (TYAD) was proposed for inclusion to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List (NPL) and subsequently added to the final NPL on August 30, 1990. The Department of the Army (DA) has been granted the authority to be the lead agency at TYAD under Executive Order 12580 and CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). The United States Environmental Protection Agency (EPA) and the Commonwealth of Pennsylvania have authority at TYAD as support agencies. The EPA Region III and the DA negotiated a comprehensive Federal Facility Agreement (FFA), which was signed by EPA on November 19, 1990, and became effective on January 19, 1991. The primary purpose of the FFA is to ensure that environmental impacts associated with past disposal activities at TYDA are thoroughly investigated, and appropriate CERCLA remedial action alternatives are developed and implemented to protect human health and the environment. The FFA has identified sixty-five (65) Areas of Concern (AOCs) within TYAD.

A CERCLA remedial action is often divided into Operable Units (OUs). As defined in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), an "Operable Unit means a discrete action that comprises an incremental step toward comprehensively addressing site problems. This discrete portion of a remedial response manages migration, or eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the site. Operable units may address geographical portions of a site, specific site problems, or initial phases of an action, or may consist of any set of actions performed over time or any actions that are concurrent but located in different parts of a site." This Record of Decision (ROD) presents a determination that no further action is necessary to protect human health and the environment at Operable Unit No. 3 (OU3), which consists of AOC #37, Building 10-C, and AOC #38, Building S-90, both located at TYAD. The no further action decision is the final action for OU3. Other OUs have been and will be defined by separate investigations.

The no further action decision is based on the AEHA Hazardous Waste Management Study (AEHA, 1993) which contains a risk assessment documenting the risks from residual contamination within and surrounding OU3 after RCRA closure. In the risk assessment, it was determined that OU3 posed no current or future potential, unacceptable human health risks. Additionally, the relatively small size of OU3 and its distance from critical environmental habitats preclude significant effects on the surrounding ecology. Therefore, the conditions at OU3 do not require further action to be protective of human health and the environment.

A feasibility study (FS), which normally develops and examines remedial action alternatives for a site, was not performed for OU2 since the results of the risk assessment indicated that no further remedial action is required at the site.

2.0 SITE NAME, LOCATION, AND DESCRIPTION

TYAD is located in Monroe County, Pennsylvania, approximately 15 miles southeast of Scranton, Pennsylvania, adjacent to the Village of Tobyhanna (Figure 1). Although the name and mission have changed since its inception in 1909, TYAD has always been a Government-Owned and Government-Operated ordnance storage during World War I. After several years of inactivity, TYAD was used as a training, equipment storage, and detention center during World War II. TYAD was again deactivated until construction of the current installation in the early 1950s.

TYAD now encompasses approximately 1,293 acres (2.2 square miles). As a communications-electronics maintenance and supply depot, the current function of TYAD is the design, fabrication, repair, and modification of a wide range of communications and electronics systems. These systems, which range in size from handheld radios to satellite communications ground terminals, are associated with navigation, aircraft survivability, surveillance, and electronics warfare.

Description of Buildings 10-C and S-90

Building 10-C is located along Third Street, between Squire and Gibbs Streets (Figure 2). Building 10-C is a concrete block structure with concrete floors and curbs that encompasses approximately 2305 square feet. Building 10-C was constructed in 1953 and modified in 1985 by adding a 1/4-inch thick epoxy floor surfacing and 5-1/2 inch curbs. From the mid-1950s hazardous wastes stored in building 10-C, mainly in 55 gallon

drums, included spent plating shop and printed circuit board solutions, pesticides, solvents, mercury and PCB items. Building 10-C was operated as an interim status RCRA hazardous waste storage facility until issuance in January 1993, by PADEP of the RCRA Part B Permit for Building H-56, the existing hazardous waste storage facility. Building 10-C was also used for storage of PCB items and non-hazardous materials prior to January 1993. Currently, Building 10-C is used only for storage of non-hazardous materials.

Building S-90 is located adjacent to Building 10-C (Figure 2). Building S-90 is a temporary corrugated metal building that encompasses approximately 7750 square feet. Building S-90 was constructed around 1957 and modified in 1983 by adding 5-1/2 inch curbs. Hazardous wastes stored in Building S-90, mainly in 55 gallon drums, since the mid-1950s included spent plating shop and printed circuit board solutions, solvents, paints thinners, batteries and cyanide. Building S-90 was also operated as an interim status RCRA hazardous waste storage facility until issuance in January 1993, by PADEP of the RCRA Part B Permit for Building H-56. Currently, Building S-90 is used only for storage of non-hazardous materials.

Both Buildings 10-C and S-90 were "closed" as hazardous waste storage facilities in accordance with requirements set forth in the RCRA Part B Permit pursuant to Section 3005 of RCRA issued to TYAD for Building H-56. Upon TYAD's receipt of the RCRA Part B Permit for storage of hazardous waste in Building H-56, hazardous waste was no longer permitted to be stored in either Building 10-C or S-90.

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3.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

In April 1987, EPA performed a preliminary review and visual site inspection to identify potential Solid Waste Management Units (SWMUs) and other areas of potential concern at TYAD (EPA, 1987). This study identified 52 SWMUs that were subsequently included as AOCs under the FFA. Two of these SWMUs, Buildings 10-C and S-90, due to the low probability that releases would jeopardize human health and the environment.

PADEP issued the RCRA Part B Permit to TYAD for Building H-56, the hazardous waste storage facility, on January 21, 1993 (PADEP, 1993a). As a condition of this Permit, PADEP required the closure as hazardous waste storage facilities of Buildings 10-C and S-90. TYAD developed a closure plan that included performance standards in accordance with Pennsylvania Code Title 25 Section 264.111 designed to control, eliminate and minimize releases of hazardous waste and hazardous waste constituents from Buildings 10-C and S-90. In order to meet these performance standards, the following closure activities were performed: (1) removal of hazardous wastes from buildings; (2) inspection of building interiors; (3) vacuuming of walls and floors; (4) decontamination of buildings; (5) sampling of building interiors and exteriors; (6) performance of a risk assessment; and (7) certification of closure in accordance with the RCRA Part B Permit.

During the period of April 12, 1993 through May 19, 1993, samples were collected to determine any residual contamination that may be present after decontamination of the buildings. Representative samples were collected from internal structures and external soils to identify and such contamination. Sampling media included wipes, ambient air, concrete floors, and both internal (under the concrete in building S-90) and external soils.

Analytical results from exterior soil samples did not provide evidence of substantial releases from Buildings S-90 and 10-C. Low concentrations of the volatile organic compound (VOC) 1,1,1-trichloroethane and the PCB Aroclor 1260 were detected along the runoff pathway from the front entrance to Building 10-C. Because concentrations were very low and there were no detections in surface samples, these analytes were not considered as contributors to risk and as a result were not included in risk assessment calculations. Several semi-volatile organic compounds were detected at levels exceeding the background concentration and were factored into the risk assessment. The presence of these compounds might be attributed to the combined influences of asphalt paving, movement and storage of equipment, and incidental releases of motor oil from vehicles. Although elevated levels of metals were present in several samples, the concentrations detected onsite did not significantly exceed background concentrations, with the exceptions of nickel (surface and subsurface) and barium (subsurface). Detections of cyanide were isolated and the levels reported were very low. Since it was not detected in surface soil samples, cyanide was not included in the risk assessment and was not considered further. Based on the types and levels of contaminants detected, as well as the tendency for levels to decrease with depth, additional soil and/or ground water investigations were determined not to be warranted. Tables 1 through 5 provide a list of contaminants of

concern (COCs) and average and maximum concentrations detected for each medium sampled. The sample location maps and complete set of sampling results are in Attachment 1.

During the course of the sampling event, Quality Assurance/Quality Control (QA/QC) measures were implemented in both the filed and laboratory to guarantee accuracy, completeness and compliance with applicable regulations. In the field, approximately five percent of the samples collected in each medium were for QA/QC related purposes. The AEHA laboratory QA program has been designed to meet or exceed accreditation/certification requirements as specified by federal, state, and private accrediting agencies. After the laboratory analyses were completed, AEHA chemists performed a QC review of the data. The QC guidelines which are followed were associated with each analytical method used. In general, the data was found to be acceptable. Data that did not meet the quality control criteria were denoted by qualifiers. A third-party quality assurance review of the data was not performed.

All results from closure activities have been documented in AEHA's Hazardous Waste Management Study (AEHA, 1993). AEHA recommended that Buildings 10-C and S-90 be certified for closure. After reviewing AEHA's study and conducting a December 10, 1993 site inspection, PADEP concluded (PADEP, 1993b) that Buildings 10-C and S-90 were closed in accordance with the specifications of the PADEP approved closure plan.

Table 1. Air Sampling Data Evaluation for Building S90, Tobyhanna Army Depot

Compound	Detection Limit (mg/m')	Arithmatic Mean (mg/m')	Coefficient of Variation (mg/m')	Maximum Detection	Two-sided Student t Test	Greater than Background? (mg/m')	Upper 95% Confidence Limit (mg/kg/d)	Reference Dose (mg/kg/d)	Slope Factor (mg/kg/d
Benzene	0.9	0.83	0.21	1	0.042	NO	N/R	N/R	N/R
Carbon tetrachloride	0.9	0.42	0.19	0.3	N/A	YES	0.45	5.71E-04	5.71E-04
Chloroform	0.9	0.38	0.54	1	0.510	NO	N/R	N/R	N/R
Ethylbenzene	0.9	0.38	0.28	0.5	0.985	NO	N/R	N/R	N/R
3-ethyl Toluene	0.9	0.46	0.059	0.5	0.000	NO	N/R	N/R	N/R
Isopropenylbenzene	0.9	0.43	0.21	.03	N/A	YES	0.47	N/D	N/D
meta/para Xylene	0.9	0.87	0.41	2	0.419	NO	N/R	N/R	N/R
n-Neptane	0.9	0.46	0.21	0.7	0.147	NO	N/R	N/R	N/R
n-propyl benzene	0.9	0.37	0.43	0.1	0.004	YES	0.44	N/D	N/D
ortho Xylene	0.9	0.45	0.070	0.5	0.001	NO	N/R	N/R	N/R
Styrene	0.9	0.41	0.30	0.05	0.016	YES	0.47	2.89E-01	N/D
Toluene	0.9	0.5	0.84	4	0.391	NO	N/R	N/R	N/R
Trichloroethane	0.9	1.7	1.8	14	0.000	NO	N/R	N/R	N/R
1,1,1-Trichloroethane	0.9	1.80	0.25	1	0.000	NO	N/R	N/R	N/R
Tetrachloroethane	0.9	0.41	0.25	0.2	0.000	NO	N/R	N/R	N/R

N/A - Compound not detected in background and therefore is considered a contaminant of concern.
N/R - Not required.
N/D - Not developed by the U.S. Environmental Protection Agency at this time.

Table 2. Air Sampling Data Evaluation for Building 10C, Tobyhanna Army Depot

Compound	Detection Limit (mg/m')	Arithmetic Mean (mg/m')	Coefficient of Variation	Maximum Detection (mg/m')	Two-sided Student t Test	Greater than Background?	Upper 95% Confidence Limit	Reference Dose (mg/m')	Slope (mg/kg/d)	Factor (mg/kg/d)
Benzene	0.9	1.0	0.52		4	0.000	NO	N/R	N/R	N/R
Carbon tetrachloride	0.9	0.44	0.25		0.7	N/A	YES	0.49	5.71E-04	5.25E-02
Chloroform	0.9	0.25	0.64		0.2	0.028	NO	N/R	N/R	N/R
Ethylbenzene	0.9	1.1	0.61		2	0.000	NO	N/R	N/R	N/R
3-ethyl Toluene	0.9	2.0	0.77		5	0.001	NO	N/R	N/R	N/R
Isopropylbenzene	0.9	0.39	0.40		0.8	0.979	NO	N/R	N/R	N/R
meta/para Xylene	2.0	4.3	0.63		9	0.000	NO	N/R	N/R	N/R
n-Neptane	0.9	1.0	0.68		2	0.000	NO	N/R	N/R	N/R
n-propyl benzene	0.9	0.47	0.55		0.8	0.005	NO	N/R	N/R	N/R
ortho Xylene	0.9	1.5	0.65		3	0.000	NO	N/R	N/R	N/R
Styrene	0.9	0.43	0.19		0.4	0.000	NO	N/R	N/R	N/R
Toluene	0.9	6.1	0.46		11	0.000	NO	N/R	N/R	N/R
Trichloroethane	0.9	13	0.93		61	0.206	NO	N/R	N/R	N/R
1,1,1-trichloroethane	0.9	1.6	0.38		3	0.000	NO	N/R	N/R	N/R
Tetrachloroethane	0.9	1.8	1.2		6	0.400	NO	N/R	N/R	N/R

N/A - Compound not detected in background and therefore is considered a contaminant of concern.
N/R - Not required.
N/D - Not developed by the U.S. Environmental Protection Agency at this time.

Table 3. Wipe Sampling Date Evaluation for Building S90, Tobyhanna Army Depot

Compound	Detection Limit (mg/cm')	Arithmetic Mean (mg/cm')	Coefficient of Variation	Maximum Detection (mg/cm')	Two-sided Student t Test	Greater than Background?	Upper 95% Confidence Limit (mg/cm')	Reference Dose (mg/kg/d)	Slope Factor (mg/kg/d)	
Cyanide	0.0125	0.0071	0.55	0.024	N/A	YES	0.0086	2.00E-02	N/D	
Lead	1.00	0.61	0.82	2.8	N/A	YES	0.80	***	***	
Tentatively identified Compounds:										
Phosphoric Acid	0.6	1.4	1.2	6.3	N/A	YES	2.0	N/D	N/D	
2,5-Dimethylfuran	0.03	0.034	0.37	0.08	N/A	YES	0.038	N/D	N/D	

N/A - Compound not detected in background and therefore is considered a contaminant of concern.
N/D - Not developed by the U.S. Environmental Protection Agency at this time.
*** - Lead is known to cause adverse health effects however, toxicity values have not been developed (see text).

Table 4. Wipe Sampling Date Evaluation for Building 10C, Tobyhanna Army Depot

Compound	Detection Limit (mg/cm')	Arithmetic Mean (mg/cm')	Coefficient of Variation	Maximum Detection (mg/cm')	Two-sided Student t Test	Greater than Background?	Upper 95% Confidence Limit (mg/cm')	Reference Dose (mg/kg/d)	Slope Factor (mg/kg/d)	
bis(2-Ethylhexyl) phthalate	0.10	0.056	0.24	0.1	N/A	YES	0.061	2.00E-02	1.40E-02	
Fluoranthene	0.10	0.051	0.04	0.06	N/A	YES	0.051	4.00E-02	N/D	
Phenanthrene	0.10	0.055	0.04	0.06	N/A	YES	0.051	N/D	N/D	
Pyrene	0.10	0.050	0.05	0.04	N/A	YES	0.050	3.00E-02	N/D	
Tentatively identified Compound:										
4-nonylphenol	0.02	0.055	1.2	0.22	N/A	YES	0.081	N/D	N/D	

N/A - Compound not detected in background and therefore is considered a contaminant of concern.
N/D - Not developed by the U.S. Environmental Protection Agency at this time.

Table 5. Outdoor Surface Soil Sampling Date Evaluation for Buildings S90 and 10C, Tobyhanna Army Depot

Compound	Detection Limit (mg/kg)	Arithmetic Mean (mg/kg)	Coefficient of Variation	Maximum Detection (mg/kg)	Two-sided Student t Test	Greater than Background	Upper 95% Confidence Limit (mg/kg)	Reference Dose (mg/kg/d)	Slope Factor (mg/kg/d)
Arsenic	0.5	4.6							
Barium	1.0	77							
Cadmium	0.25	2.4							
Chromium	0.5	19							
Lead	0.5	26							
Mercury	0.1	0.077							
Nickel	1.0	22							
Silver	0.5	0.42							
Phenanthrene	0.67	1.3							
Anthracene	0.67	0.50							
Fluoranthene	0.67	1.8							
Pyrene	0.67	1.5							
Benzo(a)anthracene	0.67	1.1							
Chrysene	0.67	1.1							
Benzo(b)Fluoranthene	0.67	1.0							
Benzo(k)fluoranthene	0.67	0.77							
Benzo(a)pyrene	0.67	0.96							
Indeno(1,2,3-cd)pyrene	0.67	0.68							
Dibenzo(a,h)anthracene	0.67	0.37							
Benzo(g,h,i)perylene	0.67	0.69							
Naphthalene	0.67	0.30							
2-Methylnaphthaiene	0.67	0.30							
bis(2-ethylhexyl)phthalate	0.67	0.35							

N/A - Compound not detected in background and therefore is considered a contaminant of concern.
N/R - Not required.
N/D - Not developed by the U.S. Environmental Protection Agency at this time.

4.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Proposed Remedial Action Plan (PRAP) for OU3 was released to the public on December 4, 1995. This document is included in the Administrative Record file and was made available for public review at the following locations:

Coolbaugh Township Municipal Building
5500 Memorial Boulevard
Tobyhanna, Pennsylvania 18466
Phone: (717) 895-6552
Hours: 8:30 a.m. to 4:30 p.m.

Tobyhanna Army Depot
Public Affairs Office
11 Hap Arnold Boulevard, Building 11
Tobyhanna, Pennsylvania 18466-5076
Phone: (717) 895-6552
Hours: 7:30 a.m. to 4:00 p.m.

The notice of availability of the PRAP document was published in The Pocono Record on December 4, 1995. A public comment period was held from December 4, 1995 through January 4, 1996. In addition, a public meeting was held on December 13, 1995, to present the PRAP for OU3 and to answer questions and receive public comments. The public meeting minutes have been transcribed and a copy of the transcript is available to the public at the aforementioned locations. A Responsiveness Summary, included as part of this ROD, has been prepared to respond to the significant comments, criticisms, and new relevant information received during the comment period. Upon signing the ROD, the Army will publish a notice of availability of this ROD in The Pocono Record, and place the ROD in the Administrative Record located in the repositories mentioned above.

5.0 SCOPE AND ROLE OF THE OPERABLE UNIT RESPONSE ACTION

To conduct investigation and cleanup activities at large Superfund sites, it is customary to manage each discrete portion of an NPL site as an Operable Unit (OU). OU1 corresponds to AOC #4 and AOC #7, which are termed as Areas A and B, respectively. OU1 addresses the area of groundwater contamination which has migrated off-base. OU2 corresponds to AOC #63, the PCB transformer storage area. This ROD for OU3 corresponds to AOC #37 and AOC #38. The Proposed Remedial Action Plans for OU1 and OU2 are in progress and will be issued in the near future. Also, one or more additional OUs may be defined hereafter based on an evaluation of existing data by EPA, PADEP, and the Army.

EPA has reviewed the AEHA risk assessment and has concurred with the Army's conclusion that the residual contamination found in Buildings S-90 and 10-C does not pose unacceptable risks to even the most sensitive individuals who have the potential to be exposed, the onsite workers. Therefore, OU3 is deemed to be already protective of human health and the environment.

6.0 SITE CHARACTERISTICS

6.1 SITE TOPOGRAPHY

TYAD lies in the southern New York section (locally termed the Pocono section) of the Appalachian Plateau Physiographic Province. The section is characterized by mature glaciated plateaus of moderate relief with broad intervening lowlands. Within TYAD, the relief varies over a range of approximately 220 feet (ft); the lowest elevation (1,930 ft) occurs south of Barney's Lake; whereas, the highest elevation (2,150 ft) occurs on Powder Smoke Ridge.

6.2 ADJACENT LAND USE

TYAD is bordered to the north, east and wet, by the Tobyhanna State Park Reserve (Figure 1). The area south of TYAD is owned by various residential property owners within the Village of Tobyhanna.

6.3 SURFACE WATER HYDROLOGY

Figure 3 shows the surface drainage features at TYAD. No through-flowing drainage ways exist on TYAD. Surface drainage, originating within TYAD, flows principally into Cross Keys Run, Barney's Lake, and Hummler Run. Oakes Swamp receives drainage from the western and northern portions of TYAD and discharges to the

north-northwest.

6.4 GEOLOGY/HYDROGEOLOGY

The surficial deposits at OU3 consist of fill derived from glacial and alluvial deposits. The relatively flat topography was influenced by the construction of the industrial area of the Depot in the early 1950s. The depth of the fill is approximately 70 feet based on the contour mapping (USAEC-WES, 1996) inferred from the monitoring well construction logs at OU1, and the inactive sanitary landfill (AOC #1). The surface water from OU3 is collected by the storm drain system which drains through 48-inch pipe outlets to the Hummler Run Watershed.

The bedrock at OU3 belongs to the Poplar Gap Member of the Devonian Age Catskill Formation. The Poplar Gap Member consists of fine to medium grained sandstones. The contour elevations inferred by existing monitoring well data indicates that the top of bedrock would be at the 1930-foot elevation. The structural geology in the OU3 area is limited. The existing information (SEVON, 1975) indicates a low amplitude syncline axis located approximately 500 feet north of the OU3 area. The relatively low amplitude and limited information on structural features would not define groundwater flow as controlled by structure. The anticipated groundwater flow pattern inthe upper bedrock would have a general south to south-east flow pattern.

6.5 ECOLOGY

With respect to ecology, OU3 has no wetlands, protected or endangered species, nor any other sensitive environments identified nearby.

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7.0 SUMMARY OF SITE RISKS

A Risk Assessment was conducted for OU3 as part of the RCRA closure process for Buildings S-90 and 10-C. The Risk Assessment can be found in the AEHA Hazardous Waste Management Study (AEHA, 1993). The Risk Assessment was based on confirmation samples taken after decontamination of the buildings to determine whether there was any lingering risk to employees working in and around these buildings.

7.1 Exposure Assessment

In order for substances from a site to pose a health risk, a complete exposure pathway must exist which finds the contaminants of concern (COCs) to a human population. A complete exposure pathway consists of four essential elements: a source and mechanism of substance release; a receiving or transport medium (air, ground water, surface water, or soil); a point of potential human contact with the substances ("exposure point"); and, an exposure route, such as eating and drinking (ingestion), breathing (inhalation), and skin (dermal) contact. If one or more of these elements is absent, the exposure pathway is incomplete and no risks currently exist.

The current and future use for these buildings is expected to be by commercial workers. No future residential use is anticipated. The area is currently zoned for industrial use and, as long as TYAD occupies the property, is expected to remain industrial. To estimate the risk to workers from exposure to interior air and dust and exterior soil, in and around Buildings S-90 and 10-C, the following exposure pathways were assessed:

- Incidental ingestion of soil and dust
- Skin contact with surface soil and dust
- Inhalation of interior air

Quantitative estimates of exposure to the contaminants detected at OU3 were calculated for each of the exposure routes. The intakes are based upon assumptions such as exposure time, exposure frequency, exposure duration, ingestion/inhalation rate, and body weight. Calculated exposure concentrations are given in Tables 6 and 7.

7.2 Toxicity Assessment

The estimated intakes are then combined with data from the toxicity assessment of the COCs to quantify potential health risks. The relationship between the dose of a compound (i.e., amount to which an individual or population is potentially exposed) and the potential for adverse effects resulting from

exposure to that dose, is an important component of the toxicological assessment. Standard reference doses (RfDs) and/or carcinogenic slope factors (CSFs) have been developed for a variety of chemicals to assess this dose-response relationship.

An RfD is developed for chronic and/or subchronic human exposure to chemicals and is based solely on the non-carcinogenic effects of chemical substances. It is defined as an estimate of the daily exposure level for the human population, including sensitive subpopulations (i.e., children and the elderly), at which no appreciable risk of adverse effects is likely to occur during a lifetime. Since a chemical can have different effects depending on the route of entry, reference doses have been developed for both oral and inhalation exposures. Dermal absorption values have not been developed for any compound and therefore, oral values are used to estimate risks for dermal exposures. Reference does usually contain safety factors to compensate for the inherent uncertainties of extrapolating from animal studies to human exposures and the lack of sufficient human data. Therefore, reference doses are conservative estimates of the quantity of a compound required for an adverse effect.

CSFs are used to estimate an upper-bound lifetime probability of an individual developing cancer as a result of exposure to a particular level of a potential carcinogen (EPA 1989). The CSFs are upper-bound estimates of the probability for a response per unit intake of a chemical over a lifetime. The factors are derived through an assumed low-dosage, linear, multi-stage model and an extrapolation from high to low dose responses determined from animal studies. The CSF is also accompanied by a weight-of-evidence classification that designates the strength of the evidence that a particular chemical is a potential human carcinogen.

The RfDs and CSFs for all of the COCs ar listed in Tables 1 through 5.

7.3 Risk Characterization

There are two types of risk that are evaluated to determine overall risk to human health - carcinogenic, and noncarcinogenic risks.

Carcinogenic risks are estimated based on the increased probability that additional cancers will occur within a population if expose to certain contaminants. The EPA has established a range of 1 X 10 4 (one additional cancer in a population of ten thousand) to 1 X 10 6 (one additional cancer in a population of one million) as an acceptable range of risk.

Remediation is generally not required when contaminant levels are within or above this range. Carcinogenic risk is calculated by multiplying the estimated intake for each contaminant by its CSF. Carcinogenic risks are considered additive across pathways, and therefore are summed to provide a single carcinogenic risk for the entire exposure scenario. The estimated carcinogenic risk for both Building S-90 and Building 10-C was calculated to be 1 X 10-5, or one additional cancer in a population of one hundred thousand, which is within the acceptable range specified in the NCP.

Noncarcinogenic risks are determined by the use of a hazard index (HI), which calculates whether the most sensitive individuals in a population could be negatively affected by chemicals. An HI is calculated by first determining the hazard quotient (HQ) for each chemical. The HQ is calculated from the ratio of the COC intake to its reference dose. The HQs for all of the COCs are then babulated to determine the HI. An HI greater than 1.0 means that there is a possible concern of potential noncarcinogenic or toxic effects from exposure to these chemicals. The HI for Building S-90 was calculated to be 0.05, and the HI for Building 10-C was 0.08, both well below 1.0.

In summary, the residual contamination in and surrounding these buildings for both carcinogenic and non-carcinogenic effects does not appear to present unacceptable potential for adverse health effects to the workers. A summary of the COCs and their carcinogenic and noncarcinogenic risks is presented tin Tables 6 and 7.

7.4 Conclusion

Based on the results of the risk assessment, known concentrations of the COCs in soils and within the buildings do not pose unacceptable human health risks to even the most potentially sensitive exposed individuals, which are onsite workers. Based on current data, neither deeper subsurface soils nor groundwater are expected to have been impacted by the residual contamination at OU3. Furthermore, significant ecological effects are not expected to occur because of the limited size of the site, its distance from critical habitats, and relative immobility of the COCs. Therefore, further response actions at OU3 are deemed unnecessary to protect human health and the environment.

Table 6. Estimated intakes and Potential Health from COCs in Building S90 and Surround Surface Soil, Tobyhanne Army Depot

Exposure Route	Contaminents of Concern	Noncarcinogenic Intake (mg/kg/d)	Noncarcinogenic Hazard Quotient	Carcinogenic Intake (mg/kg/d)	Carcinogenic Risk
Inhalation	Carbon tetrachloride	3E-05	5E-02	7E-06	4E-07
	Isopropylbenzene	N/A	N/A	N/A	N/A
	n-propyl benzene	N/A	N/A	N/A	N/A
	Styrene	4E-06	N/A	N/A	N/A
				4E-07 Subtotal	
Ingestion of Interior Dust					
	Cyanide	5E-07	2E-05	N/A	N/A
	Lead	***	***	***	***
	Phosphoric Acid	N/A	N/A	N/A	N/A
	2,5-Dimethylfuran	N/A	N/A	N/A	N/A
			2E-05 Subtotal	--- Subtotal	
Dermal Contact with Interior Dust					
	Cyanide	1E-07	5E-06	N/A	N/A
	Lead	***	***	***	***
	Phosphoric Acid	N/A	N/A	N/A	N/A
	2,5-Dimethylfuran	N/A	N/A	N/A	N/A
			5E-06 Subtotal	--- Subtotal	
Ingestion of Surface Soil					
	Nickel	2E-05	9E-04	N/A	N/A
	Phenanthrene	N/A	N/A	N/A	N/A
	Anthracene	5E-07	2E-06	N/A	N/A
	Benzo(a)anthracene	N/A	N/A	3E-07	2E-07
	Chrysene	N/A	N/A	3E-07	2E-11
	Benzo(b)fluoranthene	N/A	N/A	3E-07	2E-07
	Benzo(k)fluoranthene	N/A	N/A	2E-07	1E-08
	Benzo(a)pyrene	N/A	N/A	3E-07	2E-06
	Indeno(1,2,4-cd)pyrene	N/A	N/A	2E-07	1E-07
	Dibenzo(a,H)anthracene	N/A	N/A	7E-08	5E-07
	Benzo(g,h,i)perylene	N/A	N/A	N/A	N/A
	Naphthalene	2E-08	6E-07	N/A	N/A
	2-Methylnaphthaiene	N/A	N/A	N/A	N/A
	bis(2-ethylhexyl)phthalate	3E-07	1E-05	7E-06	9E-10
			9E-04 Subtotal	3E-06 Subtotal	

Dermal Contact with Surface Soil	4E-06	2E-04	N/A	N/A
	N/A	N/A	N/A	N/A
	1E-06	3E-06	N/A	N/A
	N/A	N/A	1E-06	8E-07
	N/A	N/A	6E-07	5E-11
	N/A	N/A	6E-07	4E-07
	N/A	N/A	4E-07	3E-08
	N/A	N/A	5E-07	4E-06
	N/A	N/A	4E-07	3E-07
	N/A	N/A	2E-07	1E-06
	N/A	N/A	N/A	N/A
	5E-08	1E-06	N/A	N/A
	N/A	N/A	1E-08	N/A
	3E-07	3E-05	2E-09	
	2E-04 Subtotal		7E-06 Subtotal	
	5E-02 Total Hazard		1E-05 Total Cancer	

N/A - Compound does not appear to cause an adverse health effect for the exposure route or toxicity date are not available.
*** - Inorganic lead does not have toxicity values, however, the concentrations present at this site are well below EPA guidance (see text).

TABLE 7. Estimated Intakes and Potential Health Risks from COCs in Building 10c and Surrounding Surface Soil, Tobyhanna Army Depot

Exposure Route	Contaminants of Concern	Noncarcinogenic Intake (mg/kg/d)	Noncarcinogenic Hazard Quotient	Carcinogenic Intake (mg/kg/d)	Carcinogenic Risk
Inhalation					
	Carbon tetrachloride	SE-05	8E-02	1E-05	6E-07
			8E-02 Subtotal		6E-07 Subtotal
Inspection of Interior Dust					
	Bis(2-ethylhexyl)phthalate	3E-06	6E-08	8E-07	1E-08
	Fluoranthene	3E-06	7E-05	N/A	N/A
	Phenanthrene	N/A	N/A	N/A	N/A
	Pyrene	3E-08	1E-06	N/A	N/A
	4-nonylphenol	N/A	N/A	N/A	N/A
			7E-05Subtotal		1E-08 Subtotal
Dermal Contact with Interior Dust					
	Bis(2-ethylhexyl)phthalate	7E-06	3E-04	2E-06	2E-08
	Fluoranthene	6E-06	1E-04	N/A	N/A
	Phenanthrene	N/A	N/A	N/A	N/A
	Pyrene	4E-06	1E-04	N/A	N/A
	4-nonylphenol	N/A	N/A	N/A	N/A
			5E-06 Subtotal		2E-08 Subtotal
Ingestion of Surface Soil					
	Nickel	2E-05	9E-06	N/A	N/A
	Phenenthrene	N/A	N/A	N/A	N/A
	Anthracene	5E-07	2E-06	N/A	N/A
	Benzo(a)enthracene	N/A	N/A	3E-07	2E-07
	Chrysene	N/A	N/A	3E-07	2E-11
	Benzo(b)fluoranthene	N/A	N/A	3E-07	2E-07
	Benzo(k)fluoranthene	N/A	N/A	2E-07	1E-08
	Benzo(a)pyrene	N/A	N/A	3E-07	2E-06
	Indeno(1,2,3-cd)pyrene	N/A	N/A	2E-07	1E-07
	Dibenzo(a,h)anthracene	N/A	N/A	7E-08	5E-07
	Benzo(g,h,i)perylene	N/A	N/A	N/A	N/A
	Maphthalene	2E-08	6E-07	N/A	N/A
	2-Methylnaphthalene	N/A	N/A	N/A	N/A
	bis(2-ethylhexyl)phthalate	3E-07	1E-05	7E-08	9E-10
			9E-04 Subtotal		3E-06 Subtotal

Dermal Contact with Surface Soil

Nickel	4E-06	2E-04		N/A	N/A
Phenenthrene	N/A	N/A		N/A	N/A
Anthracene	1E-06	3E-06		N/A	N/A
Benzo(a)anthracene	N/A	N/A		1E-06	8E-07
Chrysene	N/A	N/A		6E-07	5E-11
Benzo(b)fluoranthene	N/A	N/A		6E-07	4E-07
Benzo(k)fluoranthene	N/A	N/A		4E-07	3E-08
Benzo(a)pyrene	N/A	N/A		5E-07	4E-06
Indeno(1,2,3-cd)pyrene	N/A	N/A		4E-07	3E-07
Dibenzo(a,h)anthracene	N/A	N/A		2E-07	1E-06
Benzo(g,h,i)perylene	N/A	N/A		N/A	N/A
Maphthalene	5E-08	1E-06		N/A	N/A
2-Methylnaphthalene	N/A	N/A		N/A	N/A
bis(2-ethylhexyl)phthalate	6E-07	3E-05		1E-07	2E-09
		2E-04	Subtotal		7E-06 Subtotal
		8E-02	Total Hazard Index		1E-05 Total Cancer Risk

N/A - Compound does not appear to cause an adverse health effect for the exposure route or toxicity data are not available.
*** - Inorganic lead does not have toxicity values, however, the concentrations present at this site are well below EPA guidance (see text).

8.0 DESCRIPTION OF THE "NO FURTHER ACTION ALTERNATIVE"

Risk

From an analysis of all pertinent information for OU3, it is concluded that further actions are not necessary for the protection of human health or the environment. Therefore, the selected alternative for OU3 is the No Further Action 10-C and S-90 intact. No additional sampling or monitoring will be necessary because no future potential unacceptable threats to human health or the environment exist as a result of the prior RCRA closure action, the current low levels of residual contamination, and the current low levels of residual health and the environment. Representatives of the EPA, and the Commonwealth of Pennsylvania were appraised of the No Further Action Alternative for OU3 and concur with this decision. This alternative will have no associated costs.

9.0 RESPONSIVENESS SUMMARY

The purpose of this Responsiveness Summary is to provide the public with a summary of citizen comments concerns, and questions about OU 3, Buildings 10C and S-90, at TYAD. A public meeting was held on December 13, 1995, to present the Proposed Remedial Action Plan (PRAP) and to answer questions and receive comments. One written comment was received from the EPA. No written public comments were received during the December 4, 1995 through January 4, 1996 comment period. At the public meeting, one citizen had question regarding the PRAP.

The Responsiveness Summary is divided into the following sections:

- Selected newspaper notices announcing dates of the public comment period and location and time of the public meeting
- Comments raised during the Public Meeting, December 13, 1995
- Public meeting attendance roster
- Restoration Advisory Board Members
- Written Comments from EPA

All comments and concerns summarized in this document have been considered by EPA in making a decision regarding the selection of the No Further Action alternative at OU3.

9.1 SELECTED NEWSPAPER NOTICES

THE POCONO RECORD - December 4, 1995

PUBLIC NOTICE
TOBYHANNA ARMY DEPOT
ANNOUNCES THE AVAILABILITY OF THE PROPOSED REMEDIAL ACTION PLAN FOR A RESOURCES CONSERVATION AND RECOV-ERY ACT (RCRA) CLOSURE OF OPERABLE UNIT NUMBER 3.

The U.S. Army and the U.S. Environmental Protection Agency announce the availability of the Proposed Remedial Action Plan for the RCRA Closure at Operable Unit No. 3 at Tobyhanna Army Depot.

This RCRA closure is for two former hazardous waste storage facilities: These facilities are designated as Areas of Concern 37 and 38.

The closure action consisted of decontamination by washing and rinsing and sampling for hazardous constituents. All verification analysis results and Pennsylvania Department of Environmental Protection (PADER) Closure Verification are included in the Administrative Record.

The Proposed Remedial Action Plan is now available at information repositories located at:

Coolbaugh Township Municipal Building
5500 Memorial Boulevard
Tobyhanna. PA 18466
Phone: (717) 894-8490

Tobyhanna Army Depot
Building 11
11 Hap Arnold Boulevard
Tobyhanna. PA 18466-5076

Hours: 8 a.m. to 4:30 p.m.

Phone: (717) 895-6552
Hours: 7:30 a.m. to 4 p.m.

The Army will hold a public meeting to discuss the closure of these buildings immediately following the meeting of the Tobyhanna Army Depot Restoration Advisory Board (RAB) meeting on December 13. The RAB meeting will begin at 7 p.m. in the Coolbaugh Township Municipal Building 5500 Memorial Blvd. Tobyhanna, Pa.

Written comments on the Proposed Remedial Action Plan will be accepted for 30 days following the publication of this notice. All public comments will be included in the final legal record that details the closure action. These comments should be directed to one of the following individuals:

Criag H. Coffman (SIOTY-RK-E)
IRP Project Manager
Tobyhanna Army Depot
11 Hap Arnold Boulevard
Tobyhanna, PA 18466-5086
Phone: (717) 895-6494

Lorie Baker (SHW72)
Remedial Project Manager
U.S. Environmental
Protection Agency Region 111
841 Chestnut Building
Philadelphia. PA 19107
Phone: (717) 597-3165

PUBLIC NOTICE
TOBYHANNA ARMY DEPOT
RESTORATION ADVISORY BOARD MEETING
7 PM DECEMBER 13, 1995

The next meeting of the Tobyhanna Army Depot Restoration Advisory Board (RAB) will be conducted on December 13, 1995, at 7 p.m. in the Coolbaugh Township Municipal Building. The purpose of the RAB is to increase community involvement in Tobyhanna Army Depot's environmental restoration program.

The meeting is open to the public.

Representatives of the Army, U.S. Environmental Protection Agency, Pennsylvania Department of Environmental Protection and community members of the RAB will be present at the meeting to discuss recent progress in the depot's environmental restoration program. Immediately following the RAB meeting, there will be a public meeting to discuss the Proposed Remedial Action Plan for a Resources Conservation and Recovery Act (RCRA) closure of Tobyhanna Army Depot Operable Unit No. 3. This RCRA closure is for two former hazardous waste storage facilities.

For more information about both meetings, call Kevin Toolan in the depot's public affairs office at 717 895-6552.

THE POCONO RECORD - DECEMBER 13, 1995

Mountain area

Wednesday, December 13, 1995 B-3

Report gives Depot buildings clean bill of health

BOB KEELER
Pocono Record Writer

TOBYHANNA - No further cleanup work is needed at two Tobyhanna Army Depot buildings used to store hazardous wastes from the 1950s to 1993.

That's the conclusion of a study by the Army in consultation with the federal Environmental Protection Agency and the Pennsylvania Department of Environmental Protection.

The report is scheduled to be presented at a public meeting beginning at 7 tonight in the Coolbaugh Township building.

Fifty-fine gallon drums of chemicals - including mercury, pesticides, PCBs cleaning solutions, cyanide, paints and paint thinners - have been stored in the buildings, according to the report.

In January 1993, the depot started using another building to store hazardous wastes.

The two buildings - a 2,305-square-foot concrete block structure built in 1953 and a 7,750-square-foot corrugated metal building constructed next to it around 1957 - are referred to as 10-C and S-90.

"The Army currently intends to use Buildings 10-C and S-90 only for storage of nonhazardous materials," the report says.

Hazardous wastes have already been removed from the buildings and walls, the floors have been vacuumed, and the buildings have been decontaminated and tested, according to the report.

"The estimated carcinogenic risk for buildings S-90 and 10-C each was calculated to be ... one additional cancer case in a population of 100,000, which is well within EPA's acceptable range," the report says.

"... The residual contamination found in Buildings S-90 and 10-C does not pose unacceptable risks to even the most sensitive individuals who have the potential to be exposed, the onsite workers," the report concludes.

Public comment on the report and its findings may be made at tonight's meeting or in writing before Thursday, Jan. 4, 1996.

Written comments may be mailed to:

Craig H. Coffman (SIOTY-RK-E).
IRP Project Manager, Tobyhanna
Army Depot, 11 Hap Arnold Blvd.,
Tobyhanna, Pa. 18466-5086, or Lorie
Baker (3HW72), Remedial Project
Manager, U.S. Environmental Protec-
tion Agency Region III, 841 Chestnut
Building, Philadelphia, Pa. 19107.

Coffman may also be called at (717) 895-6494; Baker can be phoned at (717) 597-3165.

9.2 COMMENTS RAISED DURING THE PUBLIC MEETING DECEMBER 13, 1995

One citizen raised comments during the public meeting. The citizen asked several questions concerning the use of Buildings S-90 and 10-C. The questions were regarding the types of hazardous wastes stored, storage procedures, storage times, and disposal procedures. In addition, the citizen asked about building characteristics such as type of floor, floor sealant, berms, and how the building cleaning was accomplished. The citizen's questions and the Army's responses are presented below:

CONCERNED CITIZEN: My question deals with the drums that were in storage for years. Were they steel drums, fiberglass, or some other material?

ARMY RESPONSE: The drums were mainly brand new steel drums. The drums were stored in Buildings S-90 and 10-C which both have concrete and epoxy-sealed floors and berms. Although the buildings were used for storage for many years, an individual drum would not be stored for years, but would be taken off-site for disposal at regular intervals.

CONCERNED CITIZEN: Did I hear you say that you have a five and one-half inch berm for retention and an epoxy covering over that?

ARMY RESPONSE: Yes.

CONCERNED CITIZEN: Were the drums removed and taken off-site to a disposal area?

ARMY RESPONSE: Yes, the drums were removed from Buildings S-90 and 10-C and eventually taken off-site. Those drums that were not sent off-site immediately were moved to the new hazardous waste storage facility, Building H-56. Building H-56 is operated by the Defense Reutilization and Marketing Office which administers the contract for the disposal of hazardous wastes. When hazardous waste drums leave the generation shop, they are taken to the DRMO facility, processed, and shipped off-site within 90 days.

CONCERNED CITIZEN: Will any future hazardous materials that you get be taken into the new facility for temporary storage?

ARMY RESPONSE: Hazardous materials are separate from hazardous wastes. Hazardous materials are products such as paints, thinners, or materials which are flammable or could cause harm if improperly used. Hazardous wastes are spent materials which can no longer be used for what they were intended. With regard to hazardous materials, we are working very hard to eliminate or at least minimize their use by trying to find substitutes for as many hazardous materials as possible. Hazardous materials currently being used are stored in other buildings specifically designed for hazardous materials storage. With regard to hazardous wastes, all future hazardous wastes will be taken to Building H-56 for temporary storage.

CONCERNED CITIZEN: After you did the cleaning of the walls and floors, did you find everything in compliance with regulations?

ARMY RESPONSE: The materials used for cleaning and the wastewater generated from the cleaning were drummed, sampled, and disposed of properly off-site.

CONCERNED CITIZEN: I think that answers my concerns.

ARMY REPONSE: We appreciate your participation.

9.3 Public Meeting Attendance Roster

PUBLIC MEETING
FOR
PROPOSED REMEDIAL ACTION PLAN
OPERABLE UNIT 3
Building 10-C and S-90
December 13, 1995
Coolbaugh Township Building

1. Bob Gregory, ERM Inc.
2. Joe Bannon, ERM Inc.
3. Julia Oakey, Local Resident
4. Theresa Puluka, Local Resident
5. John Nidoh, TYAD
6. Joseph Maciejewski, TYAD
7. Joseph Phalen, Army Corps of Engineers
8. Ed King, Roy F. Weston, Inc.
9. Jeff Armstrong, Army Environmental Center
10. Mike Parrent, TYAD
11. MAJ Steve Hart, TYAD
12. Bill Hudson, USEPA
13. Lorie Baker, USEPA
14. ED Elliott, RAB Member
15. Francis Regan, RAB Member
16. Cullie Willis, Local Resident
17. C.W. Dennis, RAB Co-Chairman
18. Robert Ferri, RAB Member
19. Walter Burkhart, RAB Member
20. COL Greg Virgil, TYAD Commander
21. Kevin Toolan, TYAD
22. Craig Coffman, TYAD

9.4 RESTORATION ADVISORY BOARD MEMBERS

1. C. W. Dennis, Community Co-Chair
2. Frank Zardecki, DoD Co-Chair
3. Robert Ferri
4. Walter Burkhart
5. Ed Elliott
6. Francis Regan

9.5 COMMENT FROM EPA

Attachment 2 is the EPA comment letter.

In summary, issues identified by EPA included assumptions made in the risk assessment, data quality, and a "PCB hot spot" that may need further evaluation. The resolution of these issues is summarized below:

Risk Assessment: Upon review of the AEHA risk assessment, EPA concluded that it would not support the exact risk numbers calculated by the Army. However, recalculation of the risk numbers using corrected values and certain conservative assumptions, would still provide results within the EPA target risk ranges for an adult worker. Consequently, EPA did not recommend recalculating the numbers for the purpose of this ROD. The Army acknowledges EPA's comments on the risk assessment methodology and will incorporate EPA's suggested changes to the methodology in future risk assessments.

Data Quality: EPA commented on the need to document the quality of the data used for the risk assessment. Further information on the quality assurance/quality control methods used by the Army are presented in Section 3.0 of the ROD.

PCB Hot Spot: EPA commented that one area, referred to as the "PCB hot spot", may require further

investigation. An elevated level of PCBs within the building was noted in the AEHA report. The level was above established cleanup guidelines for PCBs. The Army informed EPA that further decontamination was completed in that area and that confirmation samples showed levels below the cleanup level. However, this documentation could not be located. As a result, the "PCB hot spot" was resampled on December 8, 1995. The wipe sample analysis results and sampling PCB's were at non-detectable levels in the area previously considered the "hot spot". This result indicated that the PCB clean up was successful. Both attachments are part of the Administrative Record.

10.0 REFERENCES

U.S. Army Environmental Hygiene Agency. 1993. Hazardous Waste Management Study No. 37-26-J740-93. Sampling, Evaluation, and Closure Certification for Resource Conservation and Recovery Act Closure Buildings S-90 and 10-C, Tobyhanna Army Depot, Tobyhanna, Pennsylvania, 12 April - 19 May 1993 (Volumes I and II).

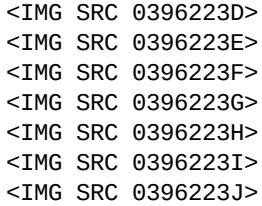
U.S. Army Environmental Hygiene Agency. 1990. Ground-Water Quality Survey No. 38-26-K914-90. Evaluation of Solid Waste Management Units, Tobyhanna Army Depot, Tobyhanna, Pennsylvania, 26 - 30 March 1990.

U.S. Environmental Protection Agency, Region III. 1987. Phase II RCRA Facility Assessment for the Tobyhanna Army Depot, May 1987.

Commonwealth of Pennsylvania Department of Environmental Resources. 1993a. Permit for Hazardous Waste Treatment, Storage, and/or Disposal Facility for Tobyhanna Army Depot, Tobyhanna, Pennsylvania, January 21, 1993.

Commonwealth of Pennsylvania Department of Environmental Protection. 1993b. Correspondence from Robert K. Lewis, Regional Facilities Supervisor, Waste Management Program, December 14, 1993.

ATTACHMENT 1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

SUBJECT: Review of AEHA Risk Assessment to Support Proposed Plan: Tobyhanna Army Depot, OU-3 (Buildings 10C and S-90)

FROM: Jennifer Hubbard, Toxicologist
Technical Support Section (3HW41)

TO: Lorie Baker, RPM
Federal Facilities Branch (3HW50)

The above document has been reviewed as historical background to support the Proposed Plan for OU-3. The following comments are offered.

The report implies that all soil samples were composites and does not mention an exception for VOCs. Samples for VOC analysis should not be homogenized or composited; this may result in underestimation of soil concentrations.

The report states that VOCs found in the concrete samples were attributed to the epoxy floor coating. The reported background sample did contain toluene, ethylbenzenes, and xylenes; references were found stating that xylenes are used in ' epoxy resins. In any case, the VOCs in the concrete were below soil RBCs and, as part of a concrete matrix, would not expect to be readily mobile or available for contact anyway.

The data that appear in Appendix G were validated by the laboratory. No third-party review in accordance with EPA guidelines was evident. The report includes discuss discussions of holding times and blanks, which are often part of third-party data review, but it is not clear whether a full review was ever undertaken. The data summary in the report appears without qualifiers. It would probably be possible to perform at least an M2 review from the information shown in Appendix G. At this site, because virtually all risks are within the target range and no further action is a likely result, the concern would be for false negatives rather than false positives.

The equation shown on page F-3 has not been verified or accepted. The reported layer thickness and particle density were not found in the cited reference. The assumption for this equation is that material on a surface would be equivalent to soil. It fails to reconcile the amount of contact with the surface that would be needed at achieve this skin loading (a 1:1 necessarily hold), and the difference between oral/dermal partitioning from skin loading and soil contact. If one assumes that a 70-Kg worker has 2000 cm2 of exposed skin, contacts a contaminated surface 8 times per day, 50% of the material on the wall is transferred to the skin, about 10% of the hand surface area of the material on the skin is transferred to the mouth, 6% of PCBs, 10% of VOC, 3% of arsenic, and 1% of other metals are absorbed through the skin and 100% of the compounds ingested are absorbed orally, and the worker works 250 days/year for 25 years, exposure to concentrations reported for the wipe samples in buildings 10C and S-90 would be expected to be within the 1E-4 to 1E-6 cancer risk range and below a Hazard Index of 1. The possible exception would be for PCBs in building 10C. This is based primarily on the detection from sample W-10-10 (12.6 ug/100 cm2) and the assumption that PCBs in the 23 non-detect samples from this building would be present at 1/2 the detection limit (1 ug/100 cm2). The 95% UCL for the building wipes (assuming lognormal distribution) would be approximately 1 ug/100 cm2; the 1E-4 cancer risk for this receptor corresponds to approximately 0.6 ug/100 cm2. Sample W-10-10 does not appear to be characteristic of the building; there may have been a "hot spot" where the two positive detections occurred: W-10-9 (1.76 ug/100 cm2) and W-10-10. The assumptions cited in this paragraph are expected to be conservative.

It is usually more advatageous to estimate risks first and then perform calculations of attribution to background.

Page F-7: Region III usually uses the upper end of the AF range (1.0 mg/cm2) instead of 0.6 mg/cm2, but 0.6 is within the reported range and is not an unreasonable assumption.

Page F-7: The cited ABS factors are from the middle of the ranges given in the cited reference. Region III typically uses the upper ends of these ranges where chemical-specific values are not available: 0.1 for SVOCs and pesticides, 0.03 for arsenic, 0.01 for most other metals.

HEAST and provisional dose-reponse parameters are available for cumene, n-propylbenzene, and other chemicals listed as "not developed."

No evidence was presented that oral dose-response parameters were adjusted for oral absorption when used to estimate dermal absorption risks (which should be performed, as stated in RAGS, Appendix A). This could result in underestimation of dermal risks.

The above issues would affect the risk calculations such that EPA may not support the exact risk numbers shown in the report (especially for wipe samples). However, if the above assumptions were used and if the data are correct as reported, the risks for indoor air, indoor and outdoor soil, and concrete would be within the target risk ranges (HI < 1 and cancer risk 1E-6 to 1E-4) for an adult worker, regardless of attribution of some chemicals to background. As stated above, wipe samples are more difficult to interpret. PCBs in building 10C appear to be on the border of the upper end of the target risk range, using conservative assumptions. If necessary, more detailed analysis of the wipe samples from this building can be undertaken.

If you have any questions concerning this review, please contact me at x1309.

cc: Eric Johnson (3HW41)

TABLE 3. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN AIR SAMPLES BUILDINGS S-90, 88, AND OUTDOOR SAMPLES, TOBYHANNA ARMY DEPOT

Analyte	Sample Numbers							
	A9001	A9002	A9003	A9003 Dup	A9004	A9005	A9006	A9007
Volatile Organic Compounds mg/m'								
benzene	1.0	-	0.8	0.8	1.0	1.0	1.0	0.8
n-Heptane	-	-	-	0.8	-	0.7	-	-
toluene	1.0	1.0	3.0	3.0	-	3.0	1.0	-
ethylbenzene	0.2	0.2	0.4	0.4	-	0.4	0.2	-
meta/para xylene	0.7	0.6	1.0	1.0	0.6	1.0	0.5	0.5
ortho xylene	-	-	0.4	0.4	-	0.4	-	-
styrene	-	-	-	-	-	0.05	-	-
3-ethyl toluene	-	-	0.5	0.4	-	0.4	-	-
chloroform	1.0	-	0.1	0.1	0.7	0.1	-	-
1,1,1-trichloroethane	-	1.0	0.6	-	0.9	0.5	1.0	0.9
trichloroethene	1.0	-	3.0	3.0	0.8	1.0	-	0.9
tetrachloroethene	-	-	0.2	-	-	0.1	-	-
isopropylbenzene	-	-	-	0.2	-	-	-	-
n-propylbenzene	-	-	0.1	-	-	0.09	-	-
carbon tetrachloride	-	-	-	-	-	-	-	-

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TABLE 3. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN AIR SAMPLES BUILDINGS S-90, 88, AND OUTDOOR SAMPLES, TOBYHANNA ARMY DEPOT (Cont.)

Analyte	Sample Numbers							
	A9008	A9008 Dup	A9009	A9010	A90011	A9012	A9013	A9014
Volatile Organic Compounds mg/m'								
	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8
benzene	-	-	-	-	-	-	-	-
n-heptane	-	-	2.0	-	-	-	-	-
toluene	-	-	0.2	-	-	-	-	-
ethylbenzene	-	-	-	0.6	0.4	0.3	-	-
meta/para xylene	-	-	0.4	-	-	-	-	-
ortho xylene	-	-	-	-	-	-	-	-
styrene	-	-	-	-	-	-	-	-
3-ethyl toluene	-	-	-	-	-	-	-	-
chloroform	-	-	-	-	-	-	-	-
1,1,1-trichloroethane	1.0	1.0	-	1.0	0.9	0.9	0.9	1.0
trichloroethene	0.3	0.6	1.0	-	0.7	0.7	-	0.4
tetrachloroethene	-	-	-	-	-	-	-	-
isopropylbenzene	-	-	-	-	-	-	-	-
n-propylbenzene	-	-	-	-	-	-	-	-
carbon tetrachloride	-	-	-	-	-	-	-	

TABLE 3. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN AIR SAMPLES BUILDINGS S-90, 88, AND OUTDOOR SAMPLES, TOBYHANNA ARMY DEPOT (Cont.)

Analyte	Sample Numbers						
	A9015	A9016	A9017	A9018	A9019	A9020	A9021
Volatile Organic Compounds mg/m'							
benzene	-	0.6	0.8	0.9	0.7	0.8	0.8
n-heptane	-	-	-	0.7	0.4	0.2	0.4
toluene	-	-	3.0	3.0	3.0	3.0	4.0
ethylbenzene	-	0.2	-	0.4	0.4	0.4	0.5
meta/para xylene	-	-	1.0	1.0	1.0	1.0	2.0
ortho xylene	-	-	0.5	0.5	0.4	0.4	0.5
styrene	-	-	-	-	-	-	0.04
3-ethyl toluene	-	-	-	0.5	0.5	0.4	0.5
chloroform	-	-	-	0.1	0.3	0.1	-
1,1,1-trichloroethane	0.7	0.9	-	0.9	0.8	0.7	0.8
trichloroethene	-	-	14.0	5.0	2.0	1.0	1.0
tetrachloroethene	-	-	-	-	-	-	0.2
isopropylbenzene	-	-	-	-	0.03	-	-
n-propylbenzene	-	-	-	-	0.1	0.08	0.1
carbon tetrachloride	-	-	-	0.3	-	0.2	0.2

TABLE 3. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN AIR SAMPLES BUILDINGS S-90, 88, AND OUTDOOR SAMPLES, TOBYHANNA ARMY DEPOT (Cont.)

Analyte	Sample Numbers							
	A88-01	A88-02	A88-03	A88-04	A88-05	Mean	A out 1	A out 2
Volatile Organic Compounds mg/m'								
benzene	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0
n-heptane	0.5	0.5	-	0.7	0.5	0.530	1.0	0.7
toluene	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0
ethylbenzene	0.4	0.4	0.4	0.4	0.3	0.380	0.5	0.4
meta/para xylene	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
ortho xylene	0.5	0.5	0.5	0.5	0.5	0.50	0.6	0.5
styrene	0.08	0.09	-	0.1	-	0.234	-	0.05
3-ethyl toluene	0.8	0.8	1.0	0.8	0.8	0.840	0.7	0.7
chloroform	0.4	0.3	0.2	0.3	0.3	0.320	0.2	0.3
1,1,1-trichloroethane	5.0	3.0	1.0	4.0	4.0	3.60	2.0	1.0
trichloroethene	22.0	13.0	7.0	9.0	9.0	11.60	14.0	5.0
tetrachloroethene9.0	9.0	5.0	6.0	6.0	6.0	6.40	0.5	0.5
isopropylbenzene	-	-	-	-	-	0.450	0.1	0.08
n-proplybenzene	0.1	0.1	0.2	0.1	0.1	0.140	0.2	-
carbon tetrachloride	-	-	-	-	-	0.450	-	-

TABLE 4. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN WIPE SAMPLES FROM BUILDINGS S-90 AND 88, TOBYHANNA ARMY DEPOT

Analyte	Sample Numbers								
	W-90-01	W-90-01 Dup	W-90-02	W-90-03	W90-04	W-90-05	W-90-06	W-90-07	W-90-08
Semi-volatile Organic Compounds mg/sample	No Target Analytes Detected At Or Above Established Detection Limits (See Appendix G, TAB B)								
PCB Analysis mg/sample	-	-	-	-	-	-	-	-	-
Cyanide mg/sample	-	-	-	-	-	-	-	2.4	-
Total Metals mg/sample Pb	-	-	-	-	-	-	-	-	-

TABLE 4. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN WIPE SAMPLES FROM BUILDINGS 2-90 AND 88, TOBYHANNA ARMY DEPOT

Analyte	Sample Numbers								
	W-90-01	W-90-02 Dup	W-90-03	W-90-04	W-90-05	W-90-06	W-90-07	W-90-08	
Semi-volatile Organic Compounds mg/sample									
	No Target Analytes Detected At Or Above Established Detection Limits (See Appendix G, TAB B)								
PCB Analysis mg/sample	-	-	-	-	-	-	-	-	-
Cyanide mg/sample	-	-	-	-	-	-	-	2.4	-
Total Metals mg/sample									
Pb	-	-	-	-	-	-	-	-	-

TABLE 4. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN WIPE SAMPLES FROM BUILDINGS S-90 AND 88, TOBYHANNA ARMY DEPOT (CONT.)

Analyte	Sample Numbers								
	W-90-09	W-90-10	W-90-11	W-90-12	W-90-13	W-90-14	W-90-15	W-90-16	W-90-17
Semi-volatile Organic Compounds mg/sample									
	No Target Analytes Detected At Or Above Established Detection Limits (See Appendix G, TAB B)								
PCB Analysis mg/sample	-	-	-	-	-	-	-	-	-
Cyanide mg/sample	-	-	-	-	-	-	-	-	-
Total Metals mg/sample									
Pb	-	-	0.28	-	-	-	-	-	-

TABLE 4. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN WIPE SAMPLES FROM BUILDING S-90 AND 88, TOBYHANNA ARMY DEPOT (Cont.)

Analyte	Sample Numbers								
	W-90-18	W-90-19	W-90-20	WP-90-21	W-88-01	W-88-02	W-88-03	W-88-04	W-88-05
Semi-volatile Organic Compounds mg/sample									
	No Target Analytes Detected At Or Above Established Detection Limits (See Appendix G, Tab B)								
PCB Analysis mg/sample	-	-	-	-	15.7	17.9	5.84	5.97	5.65
Cyanide mg/sample	-	-	-	-	-	-	-	-	-
Total Metals mg/sample									
Pb	-	-	-	-	-	-	-	-	-

TABLE 5. DETECTED CONCENTRATION OF TARGET ANALYTES IN CONCRETE SAMPLES COLLECTED FROM BUILDINGS S-90, TOBYHANNA ARMY DEPOT

Analyte	Sample Numbers								
	C-90-01	C-90-02	C-90-03	C-90-04	C-90-05	C-90-06	C-90-07	C-90-08	C-90-09
Volatile Organic Compounds (mg/Kg)									
methylene chloride	-	8.0	5.0	6.0	6.0	7.0	6.0	11.0	6.0
toluene	-	14.0	9.0	6.0	16.0	-	-	-	-
Semi-volatile Organic Compounds mg/Kg	No Analytes Were Detected At Or Above Established Detection Limits (See Appendix G TAB C).								
PCBs mg/Kg	No Analytes Were Detected At Or Above Established Detection Limits of 0.10 mg/g (See Appendix G TAB C).								
CN mg/Kg	No Cyanide Was Detected At Or Above Established Detection Limits Of 0.25 mg/g.								
Total metals mg/Kg									
Ag	2.7	0.83	-	-	2.0	-	-	2.9	-
As	34.0	3.3	3.3	3.4	3.2	2.3	3.4	2.7	3.1
Ba	0.25	44.0	33.0	32.0	34.0	65.0	50.0	35.0	36.0
Cd	10.0	0.26	8.4	-	0.59	-	-	0.79	-
Cr	4.6	20.0	13.0	9.9	15	20.0	20.0	19.0	19.0
Ni	3.9	7.4	32.0	5.2	6.3	5.9	7.2	5.7	5.7
Pb		6.9	4.2	3.5	6.2	5.7	9.1	5.7	5.7

TABLE 5. DETECTED CONCENTRATION OF TARGET ANALYTES IN CONCRETE SAMPLES COLLECTED FROM BUILDINGS S-90, TOBYHANNA ARMY DEPOT (Cont).

Analyte	Sample Numbers										
	C-90-10	C-90-11	C-90-12	C-90-13	C-90-14	C-90-21	Range	Mean			
Volatile Organic Compounds (mg/Kg)											
methylene chloride	7.0	7.0	10.0	7.0	9.0	7.0	1.0-11.0	10.3	7.0	1.0-11.0	10.3
toluene	9.0	-	-	-	6.8	-	1.0-16.0	6.8			
Semivolatile Organic Compounds (mg/Kg	No Analytes Were Detected At Or Above Established Detection Limits (See Appendix G TAB C).										
							NA*	NA			
PCBs mg/Kg	No Cyanide Was Detected At Or Above Established Detection Limits Of 0.25 ug/g.										
							NA	NA			
Total metals mg/Kg											
Ag	-	-	0.90	-	1.2	-	0.025-2.9	0.53			
As	3.0	2.9	3.1	3.1	3.0	2.7	2.3-3.4	3.01			
Ba	54.0	45.0	44.0	42.0	42.0	42.0	32.0-54.0	42.13			
Cd	-	0.34	0.32	-	0.31	0.67	0.125-8.4	0.81			
Cr	18.0	26.0	22.0	24.0	16.0	18.0	10.0-26.0	17.99			
Ni	6.7	8.7	6.7	8.1	6.2	6.3	4.6-32.0	8.24			
Pb	5.7	12.0	6.6	6.6	5.2	5.1	3.9-12.0	6.21			

* NA - not applicable

Table 6. DETECTED CONCENTRATIONS OF TARGET ANALYSIS FOR INTERIOR SOIL SAMPLE, BUILDING S-90, TOBYHANNA ARMY DEPOT

Analyte	Sample Numbers													
	I-01	I-02	I-03	I-04	I-05	I-06	I-07	I-08	I-09	I-10	I-11	I-12	I-13	I-21
Total Metals mg/Kg														
As	7.3	7.1	20	4.9	12	2.9	2.4	7.1	13	7.9	6.1	6.3	4.4	8.3
Ba	66	64	150	77.15	110	66	57	85	94	290	64	74	62	77.53
Cd	-	1.0	0.31	0.93	0.74	-	-	1.6	0.59	0.40	0.36	1.1	0.67	6.2
Cr	12	13	13	13.23	16	20	20	21	20	18	13	13	21	17.01
Ni	12	7.1	15	13.63	16	11	14	16	14	17	11	12	15	15.28
Pb	6.8	11	14	9.75	25	6.8	12	13	16	8.1	12	11	11	10.56
Volatile Organic Compounds mg/Kg	No analytes were detected at or above established detection limits (See APPENDIX G, TAB D).													
Semivolatile Organic Compounds mg/Kg														
acenaphthene	-	-	-	-	-	-	-	-	-	-	-	-	1100	-
dibenzofuran	-	-	-	-	-	-	-	-	-	-	-	-	400	-
fluorene	-	-	-	-	-	-	-	-	-	-	-	-	720	
phenanthrene	-	-	-	-	-	-	-	-	-	-	-	-	5100	-
anthracene	-	-	-	-	-	-	-	-	-	-	-	-	1400	-
fluoranthene	-	-	1000	-	-	-	-	-	-	-	-	-	7500	-
pyrene	-	-	710	-	-	-	-	-	-	-	-	-	5100	-
benzo(a)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	3000	-
chrysene	-	-	-	-	-	-	-	-	-	-	-	-	3200	-
bis(2-ethylhexyl)phthalate-		-	-	-	820	-	-	-	-	-	-	-	-	-
benzo(b)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	2500	-
benzo(k)fluoranthene	-	-	-	-	-	-	-	-	-	-	-	-	2100	-
benzo(a)pyrene	-	-	-	-	-	-	-	-	-	-	-	-	2600	-
indeno(1,2,3-cd)pyrene	-	-	-	-	-	-	-	-	-	-	-	-	1700	-
dibenzo(a,h)anthracene	-	-	-	-	-	-	-	-	-	-	-	-	390	-
benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	-	-	1400	-
Ph	10.7	11.9	8.3	12.3	11.4	12.5	12.5	10.0	12.2	12.2	9.7	9.7	12.5	10.1

TABLE 6. DETECTED CONCENTRATIONS OF TARGET ANALYTES FOR INTERIOR SOIL SAMPLES, BUILDING S-90, TOBYHANNA ARMY DEPOT (Cont.)

Analyte	Sample Numbers												
	I-01	I-02	I-03	I-04	I-05	I-06	I-07	I-08	I-09	I-10	I-11	I-12	I-13	I-21
PCBs :g/g	No analytes were detected at or above 0.10 mg/Kg													
Cyanide :g/g	No cyanide was detected at or above 0.25 :g/g.													

TABLE 7. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN AIR SAMPLES COLLECTED FROM BUILDINGS 10C AND 7

Analyte	Sample Numbers										
	A1001	A1001 Res	A1002	A1003	A1004	A1004 Res	A1005	A1006	A1007	A1007 Dup	A1008
Volatile Organic Compounds :g/mg-3											
benzene	1.3	3.0	2.0	1.0	0.7	3.0	0.7	0.7	0.65	2.0	0.60
n-neptane	0.6	2.0	0.9	0.6	0.3	2.0	0.4	0.4	0.3	-	0.2
toluene	5.0	10.0	6.0	5.0	3.0	10.0	3.0	3.0	2.0	3.0	2.0
ethylbenzene	0.9	2.0	1.0	0.9	0.5	2.0	0.5	0.5	0.4	0.9	0.4
meta/para xylene	3.0	9.0	4.0	4.0	2.0	8.0	2.0	2.0	2.0	3.0	1.0
ortho xylene	1.0	3.0	2.0	1.0	0.7	3.0	0.7	0.7	0.6	1.0	0.5
styrene	-	-	-	-	-	-	-	-	-	-	-
3-ethyltoluene	2.0	4.0	3.0	3.0	1.0	4.0	1.0	1.0	0.8	2.0	0.6
chloroform	0.2	0.1	0.1	0.1	0.2	-	-	0.1	0.08	-	0.1
1,1,1-trichloroethane	1.0	2.0	2.0	2.0	3.0	2.0	3.0	2.0	2.0	4.0	1.0
trichloroethane	9.0	26.0	10.0	7.0	9.0	12.0	4.0	5.0	5.07	16.0	6.0
tetrachloroethene	0.6	6.0	0.8	0.9	0.8	6.0	0.7	0.7	0.6	-	0.4
isopropylbenzene	-	-	0.2	0.2	0.1	0.40	-	0.1	0.09	-	-
n-propylbenzene	0.4	0.80	0.6	0.6	0.3	0.80	0.3	0.3	0.2	0.50	0.2
carbon tetrachloride	-	-	-	0.03	-	-	-	-	-	-	-
1-heptene	-	-	-	-	-	-	-	-	-	-	-

TABLE 7. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN AIR SAMPLES COLLECTED FROM BUILDING 10C AND 7 (Cont.)

Analyte	Sample Numbers											
	A1009	A1009 Dup	A1010	A1011	A1012	A1013	A1014	A1015	A1016	A1017	A1018	A1018 Dup
Volatile Organic Compounds mg/m'												
benzene	0.9	0.8	0.9	2.0	2.0	2.0	2.0	2.0	2.0	4.0	3.0	3.0
n-neptane	0.4	0.3	0.3	0.9	0.9	0.7	1.0	0.8	0.7	2.0	2.0	2.0
toluene	4.0	3.0	4.0	7.0	7.0	6.0	6.0	5.0	4.0	11.0	9.0	9.0
ethylbenzene	0.5	0.4	0.4	0.8	0.8	0.8	0.8	0.8	0.7	2.0	2.0	2.0
meta/para xylene	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	9.0	8.0	7.0
ortho xylene	0.7	0.6	0.6	1.0	1.0	1.0	1.0	1.0	1.0	3.0	3.0	3.0
styrene	-	-	-	-	0.09	-	-	-	-	-	-	-
3-ethyltoluene	0.6	0.5	0.5	1.0	0.8	0.9	0.9	0.9	0.8	5.0	4.0	4.0
chloroform	0.2	0.07	0.2	0.2	-	0.1	0.2	0.2	-	-	0.1	-
1,1,1-trichloroethane	1.0	1.0	1.0	1.0	1.0	1.0	2.0	0.8	1.0	2.0	1.0	2.0
trichloroethne	61	7.0	10	12	17	13.0	7.0	16.0	9.0	14.0	16.0	9.0
tetrachloroethene	0.4	0.3	0.8	-	-	-	-	0.3	-	6.0	3.0	3.0
isopropylbenzene	-	-	-	-	-	-	-	-	-	0.4	0.8	0.30
n-propylbenzene	-	0.09	0.09	0.2	0.2	0.2	-	-	-	1.0	0.7	0.70
carbon tetrachloride	-	-	-	-	-	-	-	-	-	-	-	-
1-heptene	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 7. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN AIR SAMPLES COLLECTED FROM BUILDINGS 10C AND 7 (Cont.)

Analyte	Sample Numbers						
	A1019	A1020	A0701	A0702	A0703	A0704	A0705
Volatile Organic Compounds mg/m'							
benzene	3.0	2.0	6.0	5.0	6.0	7.0	7.0
n-neptane	2.0	2.0	6.0	5.0	5.0	5.0	6.0
toluene	9.0	8.0	16.0	15.0	17.0	18.0	17.0
ethylbenzene	2.0	2.0	3.0	3.0	3.0	4.0	4.0
meta/para xylene	8.0	6.0	12.0	12.0	14.0	14.0	14.0
ortho xylene	3.0	2.0	4.0	4.0	5.0	5.0	5.0
styrene	-	-	1.0	1.0	1.0	1.0	2.0
3-ethyltoluene	4.0	3.0	4.0	4.0	5.0	5.0	5.0
chloroform	-	-	0.4	0.3	0.5	0.5	0.4
1,1,1-trichloroethane	2.0	2.0	16.0	16.0	17.0	17.0	19.0
trichloroethane	6.0	11.0	28.0	21.0	20.0	20.0	15.0
tetrachloroethene	4.0	3.0	1.0	0.9	1.0	1.0	1.0
isopropylbenzene	0.4	0.3	0.2	-	0.4	-	-
n-propylbenzene	0.8	0.6	0.8	0.7	0.9	0.9	0.9
carbon tetrachloride	-	0.7	-	-	-	-	-
1-heptene	-	-	-	-	-	2.0	2.0

TABLE 8. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN WIPE SAMPLES COLLECTED FROM BUILDING 10C, TOBYHANNA ARMY DEPOT

Analyte	Sample Numbers									
	W-10-01	W-10-02	W-10-03	W-10-04	W-10-05	W-10-06	W-10-07	W-10-08	W-10-09	W-10-10
Semivolatile Organic Compounds mg/sample										
bis(2-ethylhexyl)phthalate	-	-	7.0	-	5.0	-	-	-	6.0	10.0
fluoranthene	-	-	-	-	-	-	-	-	-	5.0
phenanthrene	-	-	-	-	-	-	-	-	-	-
pyrene	-	-	-	-	-	-	-	-	-	-
PCBs ug/sample										
Aloclor 1260	-	-	-	-	-	-	-	-	1.76	12.60
CN ug/sample	No cyanide was detected at or above the established detection limit of 1.25 ug/sample.									
Total metals	No target analytes detected at or above established detection limits. (See Appendix G, Tab B).									

TABLE 8. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN WIPE SAMPLES COLLECTED FROM BUILDING 10C, TOBYHANNA ARMY DEPOT (Cont).

Analyte	Sample Numbers									
	W-10-11	W-10-11 Dup	W-10-12	W-10-13	W-10-14	W-10-15	W-10-16	W-10-17	W-10-18	W-10-19
Semivolatile Organic Compounds mg/sample										
bis(2-ethylbexyl)phthatate	-	-	-	-	-	-	-	-	-	-
fluoranthene	-	-	-	-	-	-	-	-	6.0	-
phenanthrene	-	-	-	-	-	-	-	-	6.0	-
pyrene	-	-	-	-	-	-	-	-	4.0	-
PCBs ug/sample										
Aloclor 1260	-	-	-	-	-	-	-	-	-	-
CN ug/sample	No cyanide detected at 1.25 ug/sample detection limits.									
Total metals	No target analytes detected at or above established detection limits. (See Appendix G, Tab B for detection limits.)									

TABLE 8. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN WIPE SAMPLES COLLECTED FROM BUILDING 10C, TOBYHANNA ARMY DEPOT (Cont).

Analyte	Sample Numbers						
	W-10-20	W-07-01	W-07-02	W-07-03	W-07-03	W-07-04	W-07-05
Semivolatile Organic Compounds ug/sample							
BIS(2-ethylbexyl)phthalate	-	-	-	-	-	-	-
fluoranthene	-	-	-	-	-	-	-
phenanthrene	-	-	-	-	-	-	-
pyrene	-	-	-	-	-	-	-
PCBs ug/sample							
Aloclor 1260	-	-	-	-	-	-	
CN ug/sample	No cyanide detected at or above the established detection limit of 1.25 ug/sample.						
Total metals	No target analytes detected at or above established detection limits. (See Appendix G, Tab B for detection limits.)						

TABLE 9. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN CONCRETE SAMPLES COLLECTED FROM BUILDING 10C TOBYHANNA ARMY DEPOT

Analyte	Sample Numbers										
	C-10-01R*	C-10-02R	C-10-03R	C-10-04R	C-10-05R	C-10-06R	C-10-07R	C-10-09R	C-10-10R		
Volatile Organic Compounds ug/Kg											
ethylbenzene	8900	6200	6800	8300	-	-	7700	-	-	7700	-
isopropylbenzene	310	-	-	300	310	310	290	420	360		
p-isopropyltoluene	840	450	600	790	780	820	730	1100	900		
o-xylene	19000	9900	12000	18000	18000	18000	16000	21000	20000		
m&p-xylene	12000	22000	23000	20000	16000	29000	13000	15000	11000		
n-propylbenzene	-	-	-	-	-	-	-	-	-		
Toluene	-	-	-	-	-	-	-	-	-		
Semivolatile Organic Compounds (ug/Kg)											
di-a-butylphthalate	16,000	15000	6500	9800	7000	8100	13000	6800	16000		
PCBs mg/Kg											
Aroclor 1260	-	-	-	-	-	-	-	-	1.85		

TABLE 9. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN CONCRETE SAMPLES COLLECTED FROM BUILDING 10C TOBYHANNA ARMY DEPOT (Cont.)

Analyte	Sample Numbers												
	C-10-01R*	C-10-02R	C-10-03R	C-10-04R	C-10-05R	C-10-06R	C-10-07R	C-10-09R	C-10-10R				
CN mg/Kg	-	-	-	-	-	-	0.37	-	-				
Total metals mg/Kg													
Ag	-	-	-	-	-	0.55	0.56	-	0.72	0.55	0.56	-	0.72
As	6.6	6.2	5.8	6.1	5.5	6.0	4.2	10.0	5.0				
Ba	60.0	67.0	56.0	68.0	66.0	57.89	56.0	55.0	63.0				
Cd	-	0.28	0.61	-	0.54	0.97	0.28	0.65	1.1				
Cr	12.0	12.0	12.0	12.0	13.0	11.86	12.0	11.0	11.0				
Ni	14.0	14.0	14.0	14.0	22.0	13.37	13.0	17.0	13.0				
Pb	4.2	6.4	3.0	4.0	5.2	3.0	5.0	3.7	4.5				

TABLE 9. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN CONCRETE SAMPLES COLLECTED FROM BUILDING 10C TOBYHANNA ARMY DEPOT

Analyte	Sample Numbers								
	C-10-01R*	C-10-02R	C-10-03R	C-10-04R	C-10-05R	C-10-06R	C-10-07R	C-10-09R	C-10-10R
Volatile Organic Compounds ug/Kg									
ethylbenzene	8900	6200	6800	8300	-	-	7700	-	-
isopropylbenzene	310	-	-	300	310	310	290	420	360
p-isopropyltoluene	840	450	600	790	780	820	730	1100	900
o-xylene	19000	9900	12000	18000	18000	18000	16000	21000	20000
m&p-xylene	12000	22000	23000	20000	16000	29000	13000	15000	11000
n-propylbenzene	-	-	-	-	-	-	-	-	-
Toluene	-	-	-	-	-	-	-	-	-
Semivolatile Organic Compounds (ug/Kg)									
di-n-butylphthalate	16,000	15000	6500	9800	7000	8100	13000	6800	16000
PCBs mg/Kg									
Aroclor 1260	-	-	-	-	-	-	-	1.85	

TAB;E 9. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN CONCRETE SAMPLES COLLECTED FROM BUILDING 10C TOBYHANNA ARMY DEPOT (Cont).

Analyte	Sample Numbers								
	C-10-01R	C-10-02R	C-10-03R	C-10-04R	C-10-05R	C-10-06R	C-10-07R	C-10-09R	C-10-10R
CN mg/Kg	-	-	-	-	-	-	0.37	-	-
Total metals mg/Kg									
Ag	-	-	-	-	-	0.55	0.56	-	0.72
As	6.6	6.2	5.8	6.1	5.5	6.0	4.2	10.0	5.0
Ba	60.0	67.0	56.0	68.0	66.0	57.89	56.0	55.0	63.0
Cd	-	0.28	0.61	-	0.54	0.97	0.28	0.65	1.1
Cr	12.0	12.0	12.0	12.0	13.0	11.86	12.0	11.0	11.0
Ni	14.0	14.0	14.9	14.0	22.0	13.37	13.0	17.0	13.0
Pb	4.2	6.4	3.0	4.0	5.2	3.0	5.0	3.7	4.5

TABLE 9. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN CONCRETE SAMPLES COLLECTED FROM BUILDING 10C TOBYHANNA ARMY DEPOT (Cont).

Analyte	C-10-14R	C-10-Background	Range C-20-02R - 14R	Mean
Volatile Organic Compounds ug/Kg				
ethylbenzene	-	790	1.0 - 8900	3869.5
isopropylbenzene	700	-	1.0 - 700	300.2
p-isopropyltoluene	1900	-	450 - 1900	891
0-xylene	14000	1200	9900 - 21000	16590
m&p-xylene	11000	3300	11000 - 29000	17200
n-propylbenzene	460	-	1.0 - 460	46.9
Toluene	-	1800	1.0 - 1.0	1.0
Semivolatile Organic Compounds ug/Kg				
di-n-butylphthalate	17000	-	6500 - 17000	11520
PCBs mg/Kg				
Aroclor 1260	1.14	NA	0.05 - 1.85	0.34

TABLE 9. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN CONCRETE SAMPLES COLLECTED FROM BUILDING 10C TOBYHANNA ARMY DEPOT (Cont).

Analyte	C-10-14R	C-10-Background	Range C-20-02R-14R	Mean
CN mg/Kg		NA	0.125 - 0.37	0.15
Total metals mg/Kg				
Ag	-	NA	0.25 - 0.56	0.28
As	5.3	NA	4.2 - 6.6	6.07
Ba	54.0	NA	54.0 - 68.0	60.29
Cd	0.57	NA	0.125 - 0.97	0.525
Cr	11.0	NA	11.0 - 13.0	11.79
Ni	16.0	NA	13.0 - 17.0	15.04
Pb	4.9	NA	3.0 - 6.4	4.4

* R = Recollected samples - Samples were recollected for VOC and SVOC analyses - all other analyses were performed on the original samples.
** VOC concentrations for xylenes should be considered low estimates - Due to high concentrations the MS momentarily shut off.
NA - Analyte not analyzed for

TABLE 10. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN EXTERIOR SOIL SAMPLES, TOBYHANNA ARMY DEPOT

Analyte	Sample Numbers														
	B SIA	B SIB	B SIC	B S2A	B S2B	S2C	B S3A	B S3B	S3C	B S4A	B S4B	S4C	S5A	S5B	S5C
Volatile Organic Compounds (mg/Kg)															
Methylene Chloride	35.	99.	140.	87.	110.	53.	39.	20.	16.	29.	29.	30.	50.	21.	13.
	-	-	-	-	-	-	-	-	-	-	-	-	-	10*	-
PCBs (mg/Kg)															
Aroclor 1260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semivolatile Organic Compounds (mg/Kg) +															
Acenaphthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	2400.	350.	570.	3900.	-	340.	
Anthracene	-	-	-	-	-	-	-	-	610.	-	-	1200.	-	-	
Fluoranthene	-	-	-	230.	-	-	-	3700.	720.	910.	6300.	-	600.		
Pyrene	-	-	-	170.	-	-	-	2900.	490.	600.	4600.	-	490.		
Benzo(a)anthracene	-	-	-	-	-	-	-	2000.	250.	350.	3400.	-	310.		
Chrysene	-	-	-	-	-	-	-	1900.	320.	410.	3300.	-	320.		
bis(2-Ethylbexyl)phthalate	-	-	-	-	-	-	510.	240.	-	-	-	-			
Benzo(b)fluoranthene	-	-	-	-	-	-	-	1800.	350.	400.	3200.	-	340.		

TABLE 10. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN EXTERIOR SOIL SAMPLES, TOBYHANNA ARMY DEPOT (Cont.)

Analyte	Sample Numbers														
	SIA	B SIB	B SIC	B S2A	B S2B	B S2C	B S3A	B S3B	B S3C	B S4A	S4B	S4C	S5A	S5B	S5C
Semivolatile Organic Compounds (mg/Kg)															
Benzo(k)fluoranthene	-	-	-	-	-	-	-	-	-	1600.	220.	320.	1800.	-	280.
Benzo(a)pyrene	-	-	-	-	-	-	-	-	-	1800.	250.	330.	2800.	-	300.
Indeno(1,2,3-cd)pyrene	-	-	-	-	-	-	-	-	-	1200.	-	-	1900.	-	-
Dibenzo(a,H)anthracene	-	-	-	-	-	-	-	-	-	490.	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	1200.	-	-	1900.	-	180.
Naphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 10 DETECTED CONCENTRATIONS OF TARGET ANALYTES IN EXTERIOR SOIL SAMPLES, TOBYHANNA ARMY DEPOT (Cont.)

Analyte	Sample Numbers															
	S6A	S6B	S6C	S7A	S7B	S7C	S8A	S8B	S8C	S9A	S9B	S9C	S10A	S10B	S10C	
Volatile Organic Compounds (mg/Kg)																
Methylene Chloride	28.	10.	11.	23.	6.	6.	23.	15.	5.	7.	-	6.	11.	4.	3.	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PCBs(mg/Kg)																
Aroclor 1260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semivolatile Organic Compounds (ug/Kg)																
Acenaphthene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	3400.	1300.	470.	1300.	190.	-	170.	-	-	-	-	-	-	-	-	-
Anthracene	880.	360.	-	320.	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	4700.	1600.	680	1700.	250.	-	280.	240.	-	170.	-	320.	320.	-	-	-
Pyrene	4000.	1100.	470	1400.	240.	-	270.	230.	-	170.	-	260.	260.	-	-	-
Benzo(a)anthracene	2400.	660.	-	900.	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	2400.	660.	300.	920.	-	-	-	-	-	-	-	160.	160.	-	-	-
bis(2-Ethylhexyl)phthalate	-	-	-	-	-	-	-	-	-	-	310.	-	-	210.	-	-
Benzo(b)fluoranthene	2100.	580.	250.	930.	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)luoranthenef	1600.	500.	270.	670.	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 10. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN EXTERIOR SOIL SAMPLES, TOBYHANNA ARMY DEPOT (CONT.)

Analyte	Sample Numbers														
	S6A	S6B	S6C	S7A	S7B	S7C	S8A	S8B	S8C	S9A	S9B	S9C	S10A	S10B	S10C
Semivolatile Organic Compounds (ug/Kg)															
Benzo(a)pyrene	2200.	570.	260.	820.	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	1500.	290.	-	390.	-	-	-	-	-	-	-	-	-	-	-
Dibenzo(a,h)anthracene	570.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	1400.	260.	-	370.	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	-	-	32.	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	-	-	27.	-	-	-	-	-	-	-	-	-	-	-

TABLE 10. DETECTED CONCENTRATIONS OF TARGET ANALYTES EXTERIOR SOIL SAMPLES, TOBYHANNA ARMY DEPOT (Cont.)

Analyte	Sample Numbers										
	S11A	S11B	S11C	S11D	S12A	S12B	S12C	S13A	S13B	S13C	S13D
Volatile Organic Compounds (m/gKG)											
Methylene Chloride	12.	4.	-	8.	10.	-	-	7.	-	-	14.
1,1,1-Trichloroethane	-	-	-	-	-	-	-	-	-	-	-
PCBs (mg/Kg)											
Aroclor 1260	-	-	-	-	-	-	-	-	-	-	-
Semivolatile Organic Compounds (mg/Kg)											
Acenaphthene	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	330.	-	-	360.
Anthacene	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	-	-	-	220.	-	-	640.	-	220.	700.
Pyrene	-	-	-	-	180.	-	-	520.	-	170.	610.
Benzo(a)anthralate	-	-	-	-	-	-	-	340.	-	-	390.
Chrysene	-	-	-	-	-	-	-	360.	-	-	400.
bis(2-Ethylhexyl)phthalate	-	-	-	-	-	-	-	-	270.	-	-
Benzo(b)fluoranthene	-	-	-	-	-	-	-	350.	-	-	360.

TABLE 10. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN EXTERIOR SOIL SAMPLES, TOBYHANNA ARMY DEPOT (Cont.)

Analyte	Sample Numbers										
	S11A	S11B	S11C	S11D	S12A	S12B	S12C	S13A	S13B	S13C	S13D
Semivolatile Organic Compounds (mg/Kg)											
Benzo(k)fluoranthene	-	-	-	-	-	-	-	330.	-	-	-
Beno(a)pyrene	-	-	-	-	-	-	-	320.	-	-	350.
Indeno(1,2,3-cd)pyrene	-	-	-	-	-	-	-	170.	-	-	230.
Dibenzo(a,h)anthracene	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	220.
Naphalene	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	-	-	-	-	-	-	-	-	-	-

TABLE 10. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN EXTERIOR SOIL SAMPLES, TOBYHANNA ARMY DEPOT (Cont.)

Analyte	Sample Numbers												
	B S1A	B S1B	B S1C	B S2A	B S2B	B S2C	B S3A	B S3B	B S3C	S4A	S4B	S4C	S5A
Total Metals (mg/Kg)													
Silver	-	-	-	.9	-	-	-	-	-	0.9	0.9	-	1.3
Arsenic	4.9	3.	5.7	5.4	4.9	5.1	4.2	12.	6.3	3.9	4.2	6.7	3.2
Barium	160.	63.	54.	58.	49.7	25.	51.	64.	48.	59.	65.	70.	91.
Cadmium	.42	.29	-	19.	3.38	1.8	-	-	-	2.0	0.86	0.77	3.9
Chromium	9.1	17.	24.	26.	17.	13.	11.	14.	26.	18.	21.	34.	19.
Mercury	-	-	-	0.12	-	-	-	-	-	-	-	-	0.32
Nickel	14.	10.	10.	15.	15.07	7.3	14.	13.	18.	22.	18.	24.	22.
Lead	62.	16.	9.3	34.	27.	15.	11.	13.	8.9	25.	11.	16.	42.
Selenium	-	-	-	.58	-	.58	-	-	-	-	-	-	-
Nonmetals													
Cyanide (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	8.6	5.8	+	7.3	8.2	7.4	7.4	7.9	+	9.4	+	8.11	8.6

TABLE 10. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN EXTERIOR SOIL SAMPLES, TOBYHANNA ARMY DEPOT (Cont.)

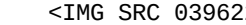
Analyte	Sample Numbers												
	S5B	S5C	S6A	S6B	S6C	S7A	S7B	S7C	S8A	S8B	S8C	S9A	S9B
Total Metals (mg/Kg)													
Silver	10.	1.7	-	-	-	-	-	-	-	-	-	-	-
Arsenic	6.8	4.6	3.7	11.	11.	8.8	8.70	9.7	3.8	7.2	18.	4.8	6.0
Barium	42.	67.4	43.	100.	110.	66.	150.	200.	75.	73.	180.	100.	94.
Cadmium	9.2	1.86	2.4	0.39	0.38	0.61	-	0.27	3.7	1.1	0.40	1.72	-
Chromium	17.	40.90	16.	16.	20.	22.	21.	32.	19	16.	22.	20.	18.
Mercury	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	14.	28.19	16.	16.	19.	16.	19.	22.	23.	14.	31.	25.18	13.
Lead	21.	11.	24.	11.	12.	71.	8.8	12.	31.	31.	8.9	16.	9.5
Selenium	-	-	-	-	-	-	-	-	-	-	-	-	-
Nonmetals													
Cyanide (mg/Kg	-	-	-	-	0.32	-	-	-	-	0.80	-	-	
pH	8.2	+	8.1	5.2	5.5	7.4	5.2	8.47	7.7	5.7	8.5	8.3	

TABLE 10. DETECTED CONCENTRATIONS OF TARGET ANALYTES IN EXTERIOR SOIL SAMPLES, TOBYHANNA ARMY DEPOT (Cont.)

Analyte	Sample Numbers														
	S9C	210A	S10B	S10C	S11A	S11B	S11D	S12A	S12B	S12C	S13A	S13B		S13C	S13D
Total Metals (mg/Kg)															
Silver	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Arsenic	3.90	4.2	4.2	6.5	5.7	4.6	5.1	6.6	5.0	4.48	1.7	2.2	4.7	6.9	
Barium	210.	83.	83.	150.	180.	86.	240.	220.	81.	76.81	630.	310.		92.	110.
Cadmium	0.27	3.9	3.9	-	0.27	1.9	0.36	-	1.2	2.25	1.6	1.1	1.9	0.30	
Chormium	22.	18.	18.	26.	38.	17.	32.	35.	16.	17.	12.	25.		20.	35.
Mercury	-	-	-	-	-	-	-	-	-	-	-	-		-	-
Nickel	20.	27.	27.	23.	25.	24.	19.	21.	24.	25.28	30.	31.		25.	24.
Lead	7.3	15.	15.	11.	9.8	10.	14.	8.3	9.4	9.2	6.2	5.7		17.	12.
Selenium	-	-	-	-	-	-	-	-	-	-	-	-		-	-
NonMetals															
Cyanide (mg/Kg)	-	-	-	-	-	0.27	-	-	-	-	-	-		-	-
pH	8.4	8.5	6.0	6.1	8.4	6.8	7.02	8.0	8.5	6.4	6.5	9.3	8.3	8.2	9.4

Refer to Appendix G, Tab E for compounds analyzed and detection limits.
* Sample was originally analyzed with a result of 6 ug/Kg.
B - Background sample.
\+ Results for SVOC analyses represent samples recollected in May 1993.
P pH results were not reported due to insufficient sample.

ATTACHMENT 2



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107-4431

December 28, 1995

Mr. Craig Coffman (SIOTY-RK-)
IRP Project Manager
Tobyhanna Army Depot
11 Hap Arnold Boulevard
Tobyhanna, Pennsylvania 18466-5086

Dear Mr. Coffman:

The purpose of this letter is to forward to you EPA's comments on the Propose Plan for Operable Unit (OU) #3, Buildings S-90 and 10-C. The Proposed Plan was reviewed by the Environmental Protection Agency (EPA) Project Manager and Attorney as a draft document, and our comments were incorporated into the final Plan. However, due to resource constraints, an EPA toxicologist was not available to review the Proposed Plan at the draft stage. Consequently, the Army and EPA agreed that the Proposed Plan could be made public and that the comment period could begin prior to the Army's receipt of EPA's toxicological review of the Plan.

Since that time, Jennifer Hubbard, an EPA toxicologist, has been assigned to the Tobyhanna Army Depot and she has completed her review of the Plan. EPA is submitting the review comments (enclosed) to the Army to be addressed in accordance with the public notification requirements under Section 113 (k) (2) (B) (iv) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as part of the Responsiveness Summary in the Rod.

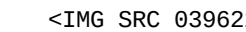
To summarize her comments, Ms. Hubbard expressed concerns regarding data quality and some of the assumptions used in the risk assessment contained in the 1993 USAEHA report, which was the basis for the "Summary of Site Risks" found in the Proposed Plan. However, her conclusion was that, if the data are correct as reported, while EPA may not agree with the exact numbers the Army developed in the risk assessment, the risks for indoor air, indoor and outdoor soil, and concrete would be within the target risk ranges (HI <1 and cancer risk 1x10 6 to 1x10 4) with the possible exception of a PCB "hit" of 12.6 ug/100 cm2 in Building 10-C.

Earlier this month I notified you of our concern regarding the PCB results, and you had informed me that the PCB "hot spot" had been further remediated during the time of the closure of Building 10-C. Wipe samples were taken after the remediation to verify that the PCB levels had substantially decreased. Furthermore, you offered to resampled the "hot spot" to verify that the PCB contamination had been adequately remediated. It is my understanding that the results of this recent sampling event included in the administrative record.

I do not expect the Army to revise the risk assessment based on these comments, but only to address and/or acknowledge them in the Responsiveness Summary of the ROD. Furthermore, as long as the PCB remediation can be verified, I do not foresee any change in the proposed selected remedy of "No Further Action" as a result of our comments.

I commend the Army for its prompt action in addressing our concern regarding the PCBs and I look forward to working with you and the State in the preparation of the ROD for OU #3. Should you have any questions or comments regarding this letter or the enclosure, please call me at (215) 597-3165.

Sincerely,



Lorie Baker
Remedial Project Manager

Enclosure

cc: J. Mellow (PADEP)
J. Armstrong (AEC)
File

Celebrating 25 Years of Environment Progress

REFERENCES

ATSDR. 1993. Toxicological Profile Update for Polychlorinated Bisphenyls. United States Public Health Service, ATSDR, Atlanta, GA.

Christiani, D.C., D. Kriebel, N.J. Fox, and E.L. Baker. 1986. Persistently elevated polychlorinated biphenyl levels form residual contamination of work place surfaces. American Journal of Industrial Medicine 10:143-151.

Environmental Criteria and Assessment Office (ECAO). 1992. Risk Assessment Issue Paper for: Evaluation of Feasibility of Oral-to-Dermal Extrapolation for PCBs. United States Environmental Protection Agency, ECAO, Cincinnati, OH. July 31.

Gilbert, R.O. 1987. Statistical Methods for Environmental Pollution Monitoring. Van Nostrand Reinhold Co., New York.

Kim, N.K. and J. Hawley. 1984. Re-Entry Guidelines: Binghamton State Office Building. Draft. New York State Dept. of Health, Bureau of Toxic Substances Assessment, Division of Health Risk Control. Albany, NY. August. Document 0549P.

Lees, P.S.J., M. Corn, and P.N. Breysse. 1987. Evidence for dermal absorption as the major route of body entry during exposure of transformer maintenance and repairmen to PCBs. American Industrial Hygiene Association Journal 48 (3) : 257-264.

Michaud, J.M., S.L. Huntley, R.A. Sherer, M.N. Gray, and D.J. Paustenbach. 1994. PCB and dioxin re-entry criteria for building surfaces and air. Journal of Exposure Analysis and Environmental Epidemiology 4(2) :197-227.

New York State Department of Health. 1985. PCB Re-Entry Guidelines. New York State Dept. of Health, Bureau of Toxic Substances Assessment, Division of Environmental Health Assessment. Albany, NY. July 17. Document 1330P.

United States Environmental Protection Agency (USEPA)-- Environmental Monitoring Systems Laboratory. Surface to Skin/Suit Transfer Studies; Transferability of Malathion Surface Residues Studies. USEPA-EMSL, Analytical Sciences Division, Las Vegas, NV.

USEPA. 1987. Polychlorinated Biphenyls: Spill Cleanup Policy. Final Rule. Federal Register, Volume 52, Number 63. April 2.

USEPA. 1989a. Risk Assessment Guidance for Superfund. Volume I: Human Health Evaluation Manual (Part A). Interim Final. Office of Emergency and Remedial Response, Washington, D.C. December.

USEPA. 1989b. Exposure Factors Handbook. Exposure Assessment Group, Office of Health and Environmental Assessment, Washington, D.C. May. EPA/600/8-89/043.

USEPA. 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03. Office of Solid Waste and Emergency Response, Washington, D.C. March 25.

USEPA. 1992a. Supplemental Guidance to RAGS: Calculating the Concentration Term. Office of Solid Waste and Emergency Response, Washington, D.C. May. Publication 9285.7-081.

USEPA. 1992b. Dermal Exposure Assessment: Principles and Applications. Interim Report. Office of Health and Environmental Assessment, Washington, D.C. January. EPA/600/8-

USEPA. 1994. Health Effects Assessment Summary Tables; Annual FY94. Office of Emergency and Remedial Response, Washington, D.C.

USEPA. 1995. Integrated Risk Information System (IRIS).

ATTACHMENT 3

<IMG SRC 0396223N>
<IMG SRC 0396223O>
<IMG SRC 0396223P>